इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 11091 (1984): Method of test for degree of curl of paper and degree of sizing [CHD 15: Paper and its products]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

IS : 11091 - 1984
(Reaffirmed 2002)

Indian Standard

METHOD OF TEST FOR DEGREE OF CURL OF PAPER AND DEGREE OF SIZING

UDC 676·019·138·3

© *Copyright* 1985

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 2

March 1985

Indian Standard

METHOD OF TEST FOR DEGREE OF CURL OF PAPER AND DEGREE OF SIZING

Paper and Its Products (Excluding Packaging Materials)
Sectional Committee, CDC 15

Chairman

SHRI N. NARASIMHAN
C-48, NDSE (Part II)
New Delhi

Members	*Representing*
SHRI M. B. N. ANAND	India Tourism Development Corporation, New Delhi
SHRI N. J. ARDESHIR	All India Federation of Master Printers, New Delhi
SHRI R. VENKATESWARAN (*Alternate*)	
SHRI S. K . BHOUMIK	Regional Research Laboratory (CSIR), Bhubaneswar
SHRI S. K. CHOPRA	Indian Paper Makers Association, Calcutta
SHRI R. C. DEVGAN	Atkins Das Pvt. Ltd, Calcutta
MAJ K. R. DHARMADHIKARY	Ministry of Defence (DGI)
SHRI C. G. TEKCHANDANI (*Alternate*)	
SHRI D. R. GUPTA	Central Revenues Control Laboratory, New Delhi
DEPUTY CHIEF CHEMIST, CENTERAL EXCISE LABORATORY, BOMBAY (*Alternate*)	
SHRI S. K. KESHAVA	I.T.C. Ltd, Calcutta
SHRI P. DAYAL (*Alternate*)	
SHRI D. MAHANTA	Regional Research Laboratory (CSIR), Jorhat
SHRI C. N. SAIKIA (*Alternate*)	
DR A. PANDA	Hindustan Paper Corporation Ltd, Calcutta
DR RAJESH PANT	Central Pulp & Paper Research Institute, Dehra Dun
SHRI R. J. PATEL	All India Small Paper Mills Association, Bombay
SHRI PARMOD JAIN (*Alternate*)	
SHRI A. N. RAO	Directorate General of Technical Development, New Delhi
DR N. J. RAO	Institute of Paper Technology, Saharanpur
DR S. BHARATI (*Alternate*)	

(*Continued on page* 2)

© *Copyright* 1985
INDIAN STANDARDS INSTITUTION
This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(*Continued from page* 1)

Members	*Representing*
Dr V. N. Sehgal	Central Forensic Science Laboratory, New Delhi
Shri M. K. Jain (*Alternate*)	
Shri T. K. Ramalinga Setty	Mandya National Paper Mills Ltd, Belagula
Shri Y. K. Sharma	Forest Research Institute & Colleges, Dehra Dun
Shri G. M. Mathur (*Alternate*)	
Shri P. S. Shivaram	India Security Press, Nasik Road
Shri K. S. A. Chary (*Alternate*)	
Shri Man Mohan Singh	Indian Paper Mills Association, Calcutta
Dr D. C. Tapadar (*Alternate*)	
Shri Prem Uberoi	Federation of Paper Traders Association of India, Bombay
Shri Ramesh S. Desai (*Alternate*)	
Shri S. K. Mathur, Director (Chem)	Director General, ISI (*Ex-officio Member*)

Secretary
Shri E. Devendar
Assistant Director (Chem), ISI

Methods of Test Subcommittee, CDC 15 : 2

Convener	
Dr D. C. Tapadar	Titaghur Paper Mills Co Ltd, Calcutta
Members	
Dr M. B. Jauhari (*Alternate to* Dr D. C. Tapadar)	
Shri K. K. Bajaj	Orient Paper Mills Ltd, Brajrajnagar
Shri Man Mohan Singh (*Alternate*)	
Shri U. K. Deb	The West Coast Paper Mills Ltd, Bombay
Shri R. V. Bhat (*Alternate*)	
Dr A. Y. Kulkarni	Pulp and Paper Research Institute, Jaykaypur
Dr Subhash Maheshwari (*Alternate*)	
Shri S. Mukherjee	Institute of Paper Technology, Saharanpur
Shri Y. P. Singh (*Alternate*)	
Dr A. K. Prasad	The Central Pulp Mills Ltd, Pune
Shri A. P. Nagarkar (*Alternate*)	
Shri Keshav Prasad	Central Revenues Control Laboratory, New Delhi
Shri S. Naryanan (*Alternate* I)	
Shri N. Subramanian (*Alternate* II)	
Shri V. N. Sehgal	Central Forensic Science Laboratory, New Delhi
Shri S. K. Gupta (*Alternate*)	
Shri P. S. Shivaram	India Security Press, Nasik Road
Shri N. P. Sarnaik (*Alternate*)	
Shri D. K. Tully	Precision Scientific Equipment Corporation, New Delhi
Dr Siddharth Ghosh (*Alternate*)	
Shri R. Varadhan	Ballarpur Industries Ltd, New Delhi

Indian Standard

METHOD OF TEST FOR DEGREE OF CURL OF PAPER AND DEGREE OF SIZING

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 28 November 1984, after the draft finalized by the Paper and Its Products (Excluding Packaging Materials) Sectional Committee had been approved by the Chemical Division Council.

0.2 This method applies the principle of wetting one side of the paper and determining (a) the maximum curvature developed, or (b) the time required to reach maximum curvature. The maximum curvature is an indication of the relative tendency of certain papers, especially printing papers, to curl under normal conditions of usage. The time required to reach maximum curvature is a measure of relative degree of sizing.

0.3 This standard is mainly based on TAPPI T 466-OS-52 'Degree of curl and sizing of paper', issued by the Technical Association of Pulp and Paper Industry.

0.4 In reporting the results of a test or analysis, made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

1. SCOPE

1.1 This standard prescribes the method of test for degree of curl and degree of sizing of paper.

2. TERMINOLOGY

2.1 For the purpose of this standard the definitions given in IS : 4661-1968† shall apply.

3. APPARATUS

---

* Rules for rounding off numerical values (*revised*).

† Glossary of terms used in paper trade and industry.

3.1 The apparatus, shown in Fig. 1, consists of a float having near the centre a rectangular wetting aperture about 50 millimetres long and a width *L* which is adjustable from zero to about 25 millimetres. A stop *H* is provided to hold one end of the curling specimen at a fixed angle *F* with respect to the horizontal. A scale with stippled surface, graduated in degrees, is fastened to the float to indicate the movement of the pointed end of the curling specimen.

3.2 Stop watch or other suitable timing device.

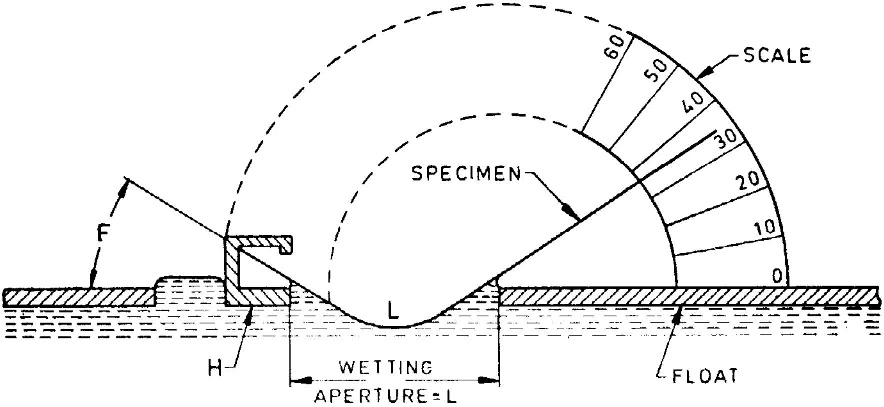

FIG. 1 CURL TESTER

3.3 Vessel container distilled water at 27 ± 2°C

4. TEST SPECIMEN

4.1 From each test unit of the sample cut specimen in the shape of a right trapezoid having an altitude of 40 millimetres in the machine direction and bases of 40 millimetres and 70 millimetres extending in the cross direction.

5. PROCEDURE

5.1 Condition the test specimen as prescribed in **5** of IS : 1060 (Part 1)-1966*.

5.2 Degree of Curl — Put the float on water, place the square end of the trapezoidal specimen under the stop with the longest, pointed side next to the scale, and allow the specimen to fall across the aperture and become wet over that area. Read the scale angle reached by the point of the specimen at the instant the direction of curling reverses. If this angle is less than 30 or more than 60 degrees, adjust the width of the aperture

---

*Methods of sampling and test for paper and allied products, Part 1 (*revised*).

until the angle lies within the desired range. In general, if the curve of the specimen departs noticeably from a circular cylindrical surface, reduce the width, in the cross direction, of the wetted portion of the specimen until the curve is substantially circular. Test in this manner at least five specimens for each side of the paper, making sure that the top of the float is dry before each test. Add the average scale angle to the horizontal (the fixed angle, about 30°) which the square end of the specimen makes with the horizontal). Divide this sum by the width in centimetres of the aperture used (length of arc of wetted, curled portion of specimen in cross direction). The result is the maximum curvature in degrees per centimetre of arc.

5.3 Degree of Sizing — Degree of sizing is determined by affixing the specimen in the apparatus as described in **5.2**. Determine the time from the moment the specimen comes in contact with the water till the point of the specimen reverses its direction of movement. For this test it is preferable to adjust the width of the aperture so that maximum curvature is reached near the middle of the scale. Test at least five specimen for each side of the range of time in seconds to reach maximum curvature.

6. REPORT

6.1 Report as degree of curl the average value and the range of maximum curvature, in degrees per centimetre of aperture width and degree of sizing, the average value, in seconds.